

OBSERVATIONS ON METROBATES HESPERIUS
UHLER (HEMIPTERA-GERRIDAE).

I. Pterygopolymorphism.¹

By H. M. PARSHLEY.

For some years I have felt a special interest in *Metrobates hesperius* Uhler, and now I propose to add from time to time to the little that is known about the species. It belongs to the Halobatinae, and is thus related to the sea-going water-striders of the genus *Halobates*, which it resembles in size and shape. Our species, however, lives inland, on bodies of fresh water, being found near the shores of large lakes and also on the pools that form below rapids and waterfalls. It is by no means uncommon, but it is decidedly local in occurrence, most collectors knowing of only one or two places where it can be taken. I have found it extremely abundant on the series of lakes at Cold Spring Harbor, on Long Island.

Like many other Gerridae, *M. hesperius* presents diverse adult forms with respect to wing development; and it is this phenomenon of pterygopolymorphism that forms the subject of the present paper. Two forms exist in this species: the macropterous, or fully winged, and the apterous, or wingless. It has been the almost universal experience of collectors to find the macropterous form extremely rare, even in localities where the apterous is abundant enough to populate the surface thickly over considerable areas, just as in other gerroid species the fully winged form, the short winged, or the wingless may predominate. Why these various relations should obtain in closely allied species under similar environmental conditions is a question that remains unanswered, though a good deal of attention has been paid to it.

On July 22, 1926, at Cold Spring Harbor I found the species abundant as usual, and, sweeping up a few according to custom to look for winged examples, I saw that half the number in the net were macropterous. Here in a moment I had caught more specimens of the rare form than in all my previous experience. In fact, I had never collected it, save from the cabinets of generous colleagues. So I gathered up a great many, adults and

¹ Contributions from the Department of Zoology, Smith College, No. 156.

nymphs, and took them into the laboratory for counting. Of the 503 adults, 234 were wingless and 269 were winged. Never before or since have I found a winged individual in that spot, and only one or two elsewhere. Among the last stage nymphs many indicated by the possession of wing-pads that they were about to develop into macropterous adults, but the younger generation already showed a great falling off in the ratio of winged to wingless individuals. I preserved about 40, those which were alate among several hundred examined, but I failed to make an exact count.

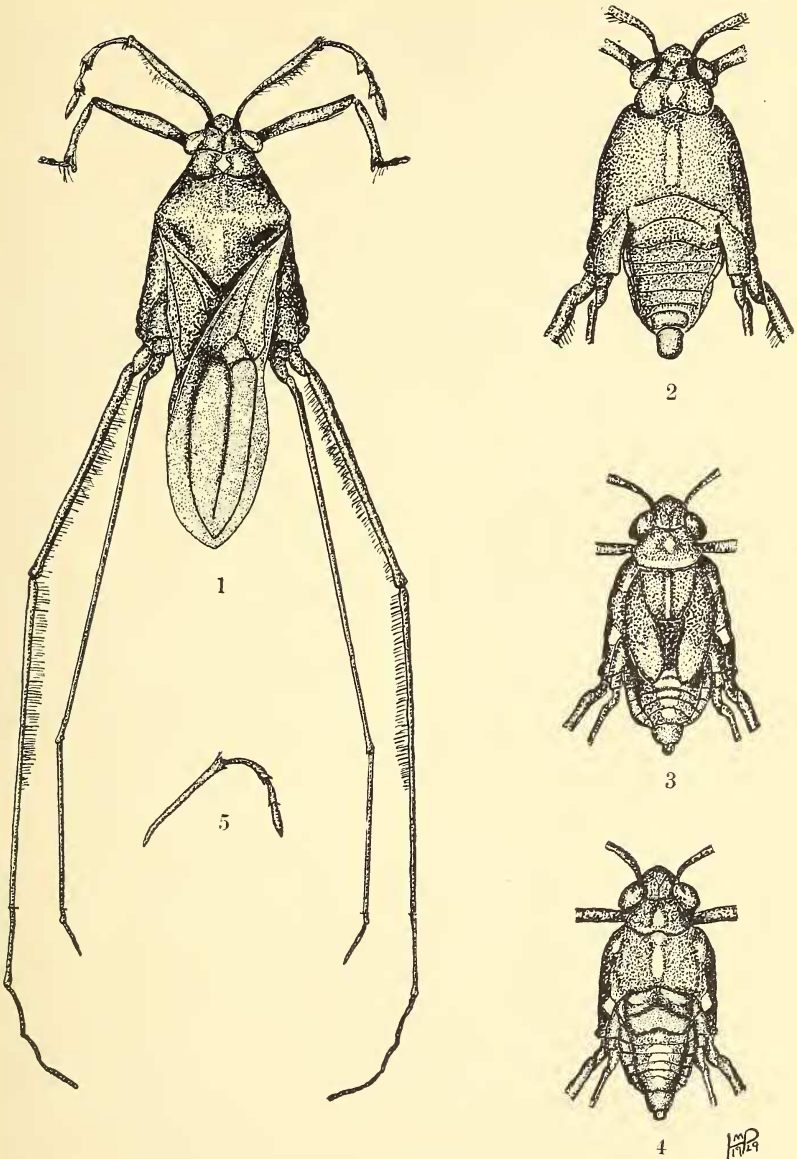
This extraordinary occurrence surely merits record, although there is no known explanation to be offered. The weather seemed ordinary, the ponds contained the usual amount of water, no special migration seemed imminent and none was observed. However, a favorable opportunity was afforded to make some study of the winged types, and so the figures on Plate XXI have been drawn in commemoration. While the primary purpose of these figures is to illustrate the rare winged form as adult and nymph (figs. 1 and 3), attention may be called here to several other points, some of which I hope to discuss more fully at another time.

The species exhibits a special degree of sexual dimorphism, wholly uncorrelated with the pterygopolymorphism. As will be seen in fig. 1, the male has thickened antennae, set with bristles, while the female (fig. 5) has slender antennae without the bristles. The mesothoracic legs of the male are likewise provided with a fringe, which is lacking in the female. The sexual difference in antennal shape can be faintly seen in the older nymphs.

In the winged forms the visible portion of the thorax, as seen from above, is all pronotum, composed of anterior and posterior lobes, while in the wingless adult (fig. 2) the largest segment of this region is the mesothorax. The detailed anatomy of adult and nymph is being worked out for later report.

The alate nymph (fig. 3) differs from the apterous (fig. 4) largely in the possession of wing-pads and in some correlated details of thoracic structure. The evident difference in outline is due largely to accidents of preservation, I think, although to judge from both dry and alcoholic material, there is a real differentiation in the shape of the thorax.

Both adults and nymphs are black or very deep brown in color, with some shading of lighter brown in places, and, in the adults,



METROBATES HESPERIUS Uhler
1 Alate adult ♂ ; 2 Apterous adult ♂ ; 3 Alate nymph ; 4 Apterous nymph ;
5 Antenna of adult ♀. x9—Parshley.

faint bluish areas of of variable development on thorax and abdomen, most noticeable in the apterous specimens. The nymphs have a bright yellow pattern, indicated in figs. 3 and 4 by white spots. Of this the adults retain only the small anterior yellow spot on the pronotum and, in the wingless form, a broad, faint bluish stripe on the mesonotum.

Only prolonged breeding experiments can determine the exact hereditary basis of the pterygopolymorphism exhibited by *M. hesperius* and similar species, but it seems reasonable to suppose that Mendelian factors, so distributed in the germplasm of the species as to produce special recombinations on occasion, might well be postulated as a working hypothesis. Of all the alate examples studied in this experience, none showed any signs of the broken hemielytra long since described in this subfamily by de la Torre-Bueno, although reproduction was in full swing.